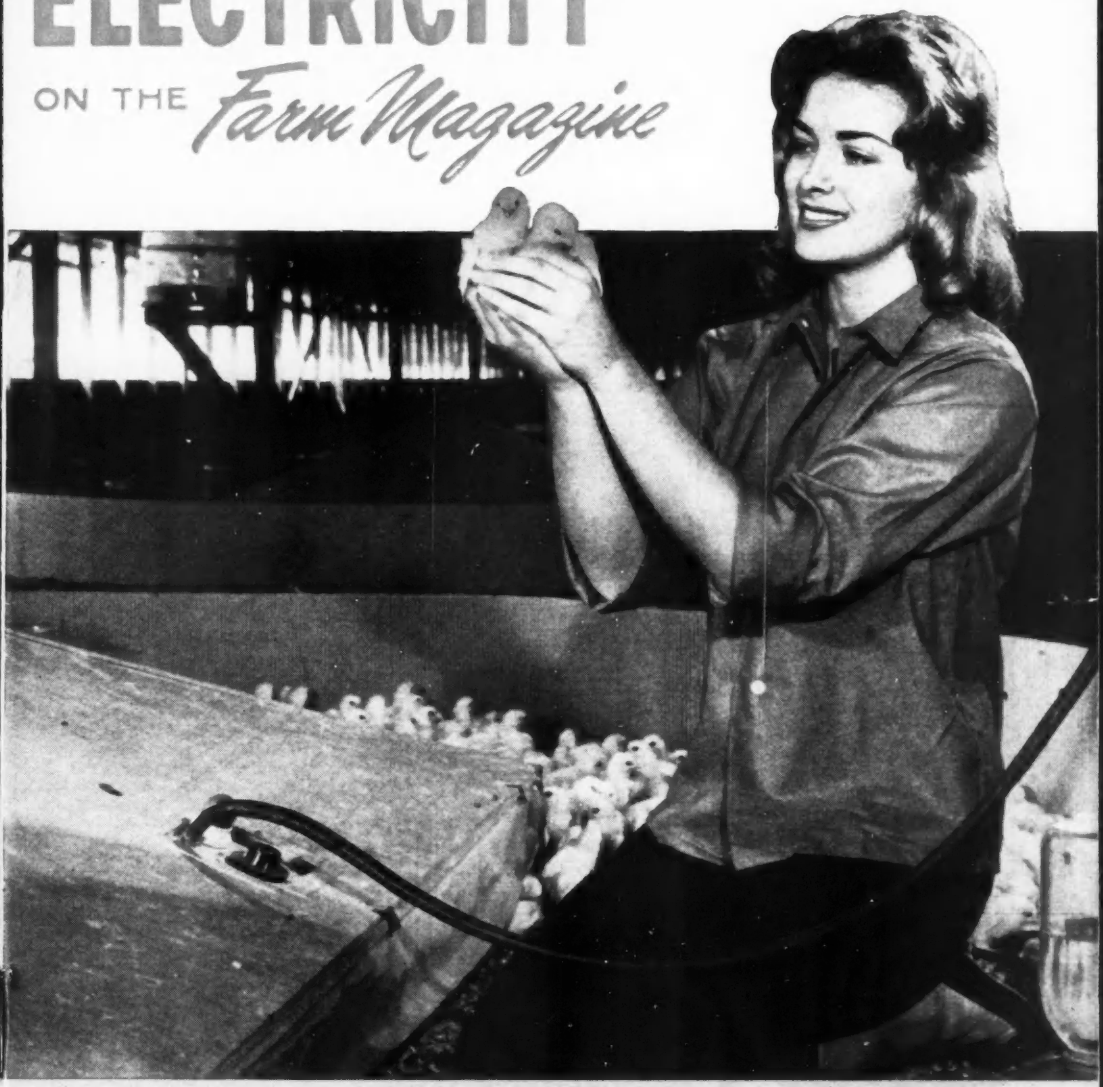
SOUTHEAST EDITION

ELECTRICITY ON THE *Farm Magazine*



These chicks are off to a good start in more ways than one. They'll get warmth and safety from their electric brooders and lots of attention from Georgia's Poultry Queen, Dorothy Taylor.

How to Wire Motor Circuits.....Page 14

Plan Your Kitchen to Save You.....Page 20

FEBRUARY, 1960

NEW "NO-FROST" KELVINATOR

Simplest, Most Economical Way To End Defrosting

in both Refrigerator and Freezer Compartments

NO FROST in the Giant 130-lb. Freezer!

Model K78M

NO FROST in the Deluxe Refrigerator!

NEW 1960

KELVINATOR

14 CU. FT.

REFRIGERATOR-FREEZER

You'll never defrost again! With this wonderful new "No-Frost" Kelvinator, frost just never forms!

And it's so dependable! The defrosting principle has been tested and proved for 10 years in hundreds of thousands of American homes. Laboratory tests show it's much more economical to operate, too!

Of course, like all Kelvinators, this big two-door model also gives you more usable space that's more convenient to use, plus more built-in quality.

Save time and steps with new Kelvinator "No-Frost." It's also available in models with the freezer at the bottom and in Fabulous Foodarama with the side-by-side upright freezer. Come see them!

• Vapor-Tight "Cold-Mist Crisper" with no-stoop convenience • Exclusive Package Pantry for pre-packaged produce • New Magnetic Door Gaskets for a perfect seal • Butter and Cheese Chests • Twin Egg Trays hold two dozen eggs • Full-Size Adjustable Gliding Shelf of rust-free aluminum • Handy "Eject" Ice Trays plus Ice Cube Container

Built Better to Serve Better

Kelvinator Appliances

KELVINATOR DIVISION, AMERICAN MOTORS CORP., DETROIT 32, MICHIGAN

Refrigerators • Electric Ranges • Automatic Washers • Clothes Dryers • Home Freezers • Room Air Conditioners

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SOUTHEAST EDITION

ELECTRICITY ON THE *Farm Magazine*

A REUBEN H. DONNELLEY PUBLICATION

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I. HERBERT CASE, *Publisher*
W. J. RIDOUT, JR., *General Mgr. and Edit. Director*
HUGH J. HANSEN, *Editor*
TOM MILLIGAN, *Southwest Editor*
ALBERT MORRIS, JR., *Southeast Editor*
RUTH GAFFNEY, *Home Editor*
A. J. RADWIN, *Editorial Asst.*
R. A. NELSON, *Presentation Editor*
K. H. GORHAM, *Advertising and Business Mgr.*
C. J. SCHWARTZ, *Midwest Advertising Mgr.*

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EDITORS' CHAT

YOUNGSTERS AND CHANGE

Youngsters never cease to amaze us with what they can do. But we were a little surprised when we dropped in on North Carolina's 13th annual 4-H Farm and Home Electric Congress. The teen-agers there talked about electricity with ease and confidence, and when some of them stepped forward to give their demonstrations, it was obvious they knew their subject well.

Which leads us to suggest that the whole family help encourage its 4-H, FFA or FHA members to take full advantage of the projects which bring to them so much practical knowledge and experience.

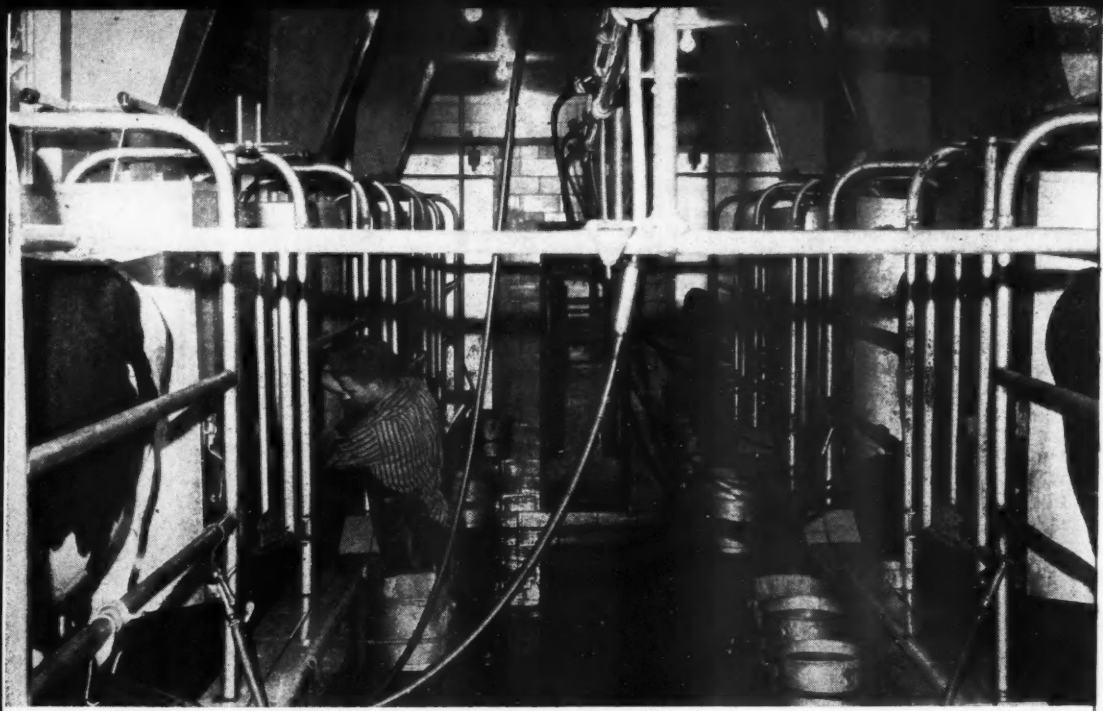
They are starting off in an age when change is the order of the day. Not from generation to generation, but from year to year and week to week. Methods that were good enough to return a profit last year may not be quite so good in 1960.

One area of change that continues to demand study and planning is the substitution of machinery for muscle power. You wouldn't think about working for a nickel a day. That would be the cost of operating a ¼ hp electric motor for eight hours. And this motor can do the work of the average man where the job is one that can be mechanized. Take a second look at your chores during 1960. See if there isn't a better way of doing them. ALBERT MORRIS, JR.

ELECTRICITY SPARKS THE '60s

"Electricity Sparks the '60s" is the theme for the annual National Electrical Week being observed February 7-13. This annual observance focuses attention on the contributions of electricity to our American way of life. Very appropriately the event is scheduled during the week of Thomas A. Edison's birth, February 11, 1847.

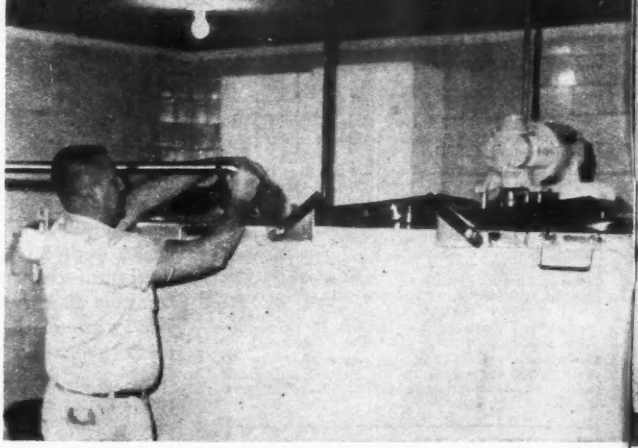
Imagine, if you can, what life today would be like without electricity. Imagine a world without electric lights, radio, television, refrigerators, food mixers and the hundreds of other electrical items around the home. Imagine also trying to perform the numerous farm chore jobs without the help of electric water pumps, bunk feeders, heating cables, yard lights, mechanical poultry feeders, milkers, welders or grinders just to mention a few. Practically every phase of farming is affected by electricity. It works in a thousand different ways to make your life easier and more enjoyable—to help you farm better and live better—Electrically. HUGH J. HANSEN



Walk-through, 8-stall milking parlor allows two men to carry on operation from pit. Water hoses with spray nozzles are conveniently located for washing each cow. Feed flows by gravity from storage overhead. Five of the 10 ceiling lights are replaced in winter with infrared heat lamps, which keep operator comfortable without heating the air in the house.

By **ALBERT MORRIS, JR.**

Feature that Bobby Baker likes about new parlor is that there is no stooping or bending to place milkers on cows.



Milk flows from cows to this 5 hp, 1000-gallon bulk tank. When milking is finished, pipe connecting tank with pipeline is removed . . . . . .

Chores Are Easier in a
MODERN MILKING PARLOR

New systems increase capacity, save time and labor

A modern 8-stall walk-through milking parlor with pipeline system and bulk tank has taken the place of the rambling old stanchion barn on the farm of J. Frank Baker & Son at Montevallo, Alabama. If these veteran dairymen have any regrets about the change, one is assured that the regrets are purely sentimental.

Bobby Baker, the son in this partnership and once a college football player, describes the change as something that had to be done. Twice a day he and one helper milk 120 Holsteins. Therefore, he knows first-hand what a difference the new parlor has made.

"In the old barn we used three men and really needed four," he explains. "Preparation, milking and cleaning required 5 to 5½ hours. Now two of us do the whole job in only 4 hours.

"The work is easier, too. Stooping and bending to wash cows and put on milkers was about to get the best of me, but that is a thing of the past. We don't have to carry feed and milk, either. When you get through in here you feel like doing something else.

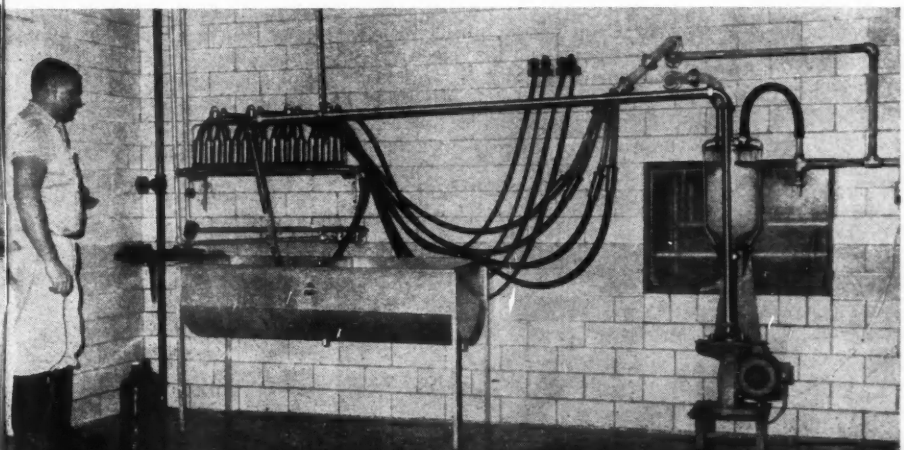
"Lighting is better. We have ten 60-watt bulbs overhead—five on each side—so we don't work in a shadow. In winter we replace five of these bulbs with heat lamps. Makes it comfortable on a cold day."

Plenty of water under pressure is conveniently available to make cleaning a quick job. Cleaning of equipment is simplified by a clean-in-place mechanical system.

The 1000-gallon bulk tank out of which milk is sent to market every second day can be cleaned in the time that was required to wash 6 or 7 milk cans, Bobby says. Their operation formerly required 30 to 40 cans, and washing them was no easy task.

Feed is stored above the milking parlor. It is issued to individual animals by simply turning a handle as the cows are brought into the milking stalls.

In addition to its other advantages, Bobby says the new milking parlor paves the way for herd expansion. He figures the installation, operated by two men, will take care of 200 cows. □ □



. . . and turned over sink for cleaning. Clean-in-place mechanical system for pipelines and milkers was in operation when this picture was taken. System washes, rinses and sanitizes equipment automatically.

Brooders are fused individually. Receptacle is fused, polarized type. Three-prong plug grounds brooder through wiring system.

Hovers of electric brooders can be lifted out of way when chicks no longer need brooding. Camp especially likes electric units' convenience.

When it comes

to broiler growing . . .

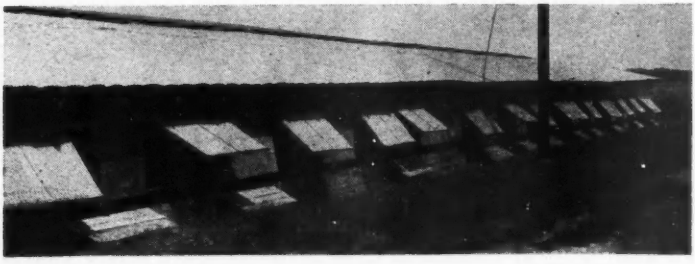
Good Wiring Means Better Brooding

Thinking about building a new broiler house? Or of reducing your brooding expense by converting an old house to electric brooding?

If you are, you also should be sure to provide adequate electric service. That is one point that L. J. Camp of Chesnee, South Carolina, considered carefully when he built a new 250-foot-long, 10,000-bird unit. He uses 14 hover-type electric brooders.

In Camp's case, the broiler house increased the electrical load enough so that he had to install a larger service entrance. His new 200-ampere service entrance is mounted on a central distribution pole. This change gave him an opportunity to have his water pump wired in parallel, which simply means that he is able to cut off all other electric service on the farm without interrupting the water supply—a fire safety feature.

To help him plan an adequate, economical wiring system for his broiler house, Camp called on a representative of his power supplier. He followed the plan they agreed upon. □ □



Electric service for this broiler house enters from pole midway of length of building. Splitting service at middle of house allows use of smaller-size wiring inside because wire lengths are shorter.

THIS IS THE WAY HE FEEDS HIS HERD

Set a timer, push a button, and the cows get fed. Sanford can go about his other chores or even take a breather while automatic equipment does the work.

Because it lets him do a better job of feeding, W. W. Sanford Jr. gives his silo unloader and bunk feeder a lot of the credit for the higher production of his dairy herd last winter.

Milk Production Up 10,000 Lbs.

The Orange, Virginia, farmer milks 80 Holsteins. In some months last winter his milk production climbed 10,000 pounds higher than it was in the same month of the preceding year. Also production was steady. There was no change in the number of cows.

The obvious difference, Sanford says, is his feeding. He now gives his cows silage three times a day. They get all they will eat, and they eat more than ever before. The reason for this, he believes, is that the silage is cut and pulverized by the unloader, making it more palatable. Further, it is always fresh.

No Waste or Spoilage

His 400-ton silo is 20 x 50 feet. The unloader is operated by a 5 hp electric motor. It makes a 3-inch cut and completes a revolution every 15 minutes. The unloader is lowered as necessary by means of a winch, so that climbing into the silo is a task that has to be done only once every 8 or 10 days.

The shuttle-type bunk feeder is powered by a 2 hp electric motor. These two pieces of equipment combine to give Sanford an automatic feeding system in which there is no waste or spoilage. It means his cows get silage regularly, regardless of weather or availability of labor.

"Feeding is so easy I can do it on Sundays without bothering to change clothes when I come from church," he declares enthusiastically.

Important as the increased milk production is, this is not the whole story for Sanford. He says that he is able to do a much better job of feeding dry cows and heifers, too. A little calculation and he comes up with the confident prediction that his silo, unloader, bunk feeder, shed and concrete feeding area will pay for themselves in three years. □ □

Feed bunk is covered so cows can eat comfortably (and more) in bad weather. Bunk lights encourage night feeding, which often increases milk production.

Timer on his mill is regulated by J. H. Shirley. Mill grinds 4 ingredients, as evidenced by four tubes leading into it from above. Proportion is varied by adjusting dials.

Mixer-grinder on Roberts' farm is installed on lower level of 2-story building. Ingredients are stored in wooden bins above and flow by gravity through two tubes into mill below.

How to Cut Poultry Costs

Raisers find that home-made feed saves them about $20 a ton

Faced with a low market price for their eggs and broilers, poultrymen have been looking for ways to cut production costs. Some are finding they can do it by making their own feed.

W. I. Roberts, of Fayette, Alabama, claims he is saving $18 to $20 per ton on feed for his 30,000 broilers. He buys grain and concentrate; mixes an 18% protein ration for $70 per ton. To do the processing, he has been using a 2 hp electric mixer-grinder for nearly three years.

Uses 2-Level Building

Roberts has installed the mill on the lower level of a two-story structure that doubles as a garage. He drives into the upper level from the front and into the lower level from the back. Grain and concentrate are stored in wooden bins on the top floor and flow to the mill by gravity. Feed is augered from the mill into a truck and transported to holding bins and automatic feed hoppers in the broiler houses.

Uses Home-Grown Grains

Grinding his own feed also lets Roberts use home-grown grains. He has been in the broiler business 12 years and figures he can stay in it if he can continue to hold down production costs by processing his own feed.

Three years ago J. H. Shirley of Honea Path, South Carolina, bought one of the 2 hp mixer-grinders and began processing feed for 2200 layers. He claims that he consistently saves upwards of $20 a ton on feed. Shirley mixes the maximum four ingredients the mill will handle —corn, oats, milo and supplement. His system has bins for storage above the mill.

The South Carolinian says neighbors had described the mill as a "coffee grinder" and predicted it was too small. But in three years the only maintenance required was a new set of hammers. Using a ⅜-in. screen, he processes 700 lbs. of feed per hour. Further, the mill has a timer so that it can be set to run for specific intervals.

Depending on the elaborateness of the storage and handling system, mixer-grinder owners report that they are installing feed processing systems for $1500 to $2500. □ □

Here is a

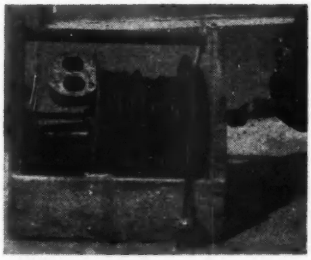
Handy Reel For Extension Cords

Extension cords snaking around on the ground can present a hazard. Besides the danger of tripping up an unwary person, they can get caught in equipment or damaged in other ways.

Here's a good way to take care of that problem—a portable extension cord reel. Cecil Browning, manager of the Dr. Borman Farm in Waukesha Co., Wisconsin, thought up the arrangement. He mounted an old cable spool and a double outlet in an assembly resembling a tool box.

Browning finds the reel very handy to carry around. It keeps the cord out of the way and in good shape. He also has built a reel for a larger cable, using an old garden hose reel in place of the cable spool.

RALPH BOWEN



Extension cord is rolled onto the reel by means of this hand crank on the outside of the box.

No waiting, crowding, pushing. Everyone gets his share at CLAY Mechanical Feeder.

How you can feed 50 head in 9 minutes

No more crawling up an icy chute, chopping frozen silage, and forking down unpalatable chunks your cattle won't eat.

Just flip a switch and let your CLAY Silo Unloader and Mechanical Feeder do the work for you. It doesn't matter if the silage is frozen solid. This combination will handle *any* silage, even frozen grass.

Improves Quality of Silage . . . Even more important, the modern CLAY push-button feeding system will actually improve the *palatability* of your silage. There will be no frozen chunks for your cattle to nose aside and waste. Silage is cut into small particles, thoroughly mixed, and fluffed up the way cattle like it. They'll eat more and produce more milk or meat from a ton of silage. This means more profit for you.

With a CLAY Silo Unloader and Mechanical Feeder you can easily feed 20 head in 5 minutes . . . 50 in 9 minutes . . . or 150 in 20 minutes.

Initial cost and operating cost are low for both machines. A few cents worth of electricity will throw down a ton of silage and distribute it along your feed bunks. No sense spending hours working up a sweat in a cold silo when electricity can do the job so cheaply and easily.

CLAY Silo Unloaders offer big advantages over other unloaders. They handle frozen silage . . . seldom need repair . . . are easily moved from silo to silo . . . fit all standard silos. Your CLAY Dealer provides fast service when you need it.

CLAY Mechanical Feeders also offer important features. You can easily install them in your present bunks. Changes in direction are simple and they fit practically any layout. They can be quickly adjusted to handle grain, corn, and chopped hay as well as silage.

Free Planning Book . . . For free idea booklets on Silo Unloaders, Mechanical Feeders, Barn Cleaners, and Milking Parlors, write to Clay Equipment Corp., 202 Pearl St., Cedar Falls, Iowa . . . *Today.*

Unloader raises and lowers easily
Handles all silage . . . even frozen grass
Unloader and Feeder can be moved easily
Just push a button to unload and feed
Augers mix supplement with silage
Feeder shown is 50' long. All sizes available
One drive unit serves Feeder up to 150' long
Cattle don't crowd.
SILO UNLOADER LICENSED UNDER PATENT 2,719,058

With CLAY Purchase Plan, You Can Mechanize Your Feeding NOW!

You needn't wait. Pay for your equipment while it does your work. As little as $29.82 a month will pay for your Silo Unloader, $17.96 a month for your Feeder. You can enjoy the benefits of push-button feeding within weeks. Ask your CLAY Dealer for more information or write to CLAY.

Cleaning of pipelines and other dairy equipment requires a heater that can supply an ample amount of hot water during the relatively short cleanup period.

Dairy Hot Water Use Increasing

By C. N. TURNER*

Heating water a few degrees provides a "magic cleaner" that is essential to the dairyman in keeping his milk handling equipment sanitary for the production of quality milk.

Only a few years ago a 10 or 15 gallon "pour in" type electric water heater met the needs of most dairymen. Today 30, 50, 80 or even 120 gallon "pressure" type heaters are necessary to meet the requirements of new milk handling, cooling and storage equipment.

Since recommendations for water heating vary so widely, a field study was made on 82 New York State dairy farms to develop a method of estimating hot water needs. All farms studied had bulk coolers; 37 had both coolers and pipeline systems.

Most dairymen without pipelines used less than 1 gallon of 150°F water per cow with the highest users requiring 1¼ gallons. When the bulk tank was cleaned with hot water in a bucket, 1 gallon of 150°F water was required for each 100 gallons of tank capacity. When tanks were cleaned by flooding the bottom of the tank, 2 gals. for each 100 gals. of capacity were needed.

Based on these farm hot water usage records, the following methods were developed for estimating the gallons of 150°F water required:

Estimating Hot Water Requirements (without pipeline)

1. Allow one milking machine unit for each 10 cows plus one additional milker unit to cover the hot water needs for washing miscellaneous utensils.
2. Allow 3.2 gallons of 120° water for each milker unit and calculate the amount of 150° water needed to blend with the cold water.
3. Allow 1/5 gallon of 150° water for each cow per milking for udder washing and sanitizing teat cups.
4. Calculate the amount of water needed for rinsing, washing, and sanitizing the bulk milk tank as previously described.

Hot water used on the 37 farms with pipeline milking systems varied widely with the different types of milk transporting systems, the type of housing and the system used for cleaning.

The "air and water" system of cleaning the pipelines averaged 54 gallons of 150°F water a day for around-the-barn installations with 200 to 299 feet of line and 58 gallons a day for parlor installations with lines ranging from 40 to 90 feet in length.

The "filled water" system of cleaning the pipeline averaged 96 gallons of 150°F water a day for around-the-barn installations with 280 and 300 feet of line and 75 gallons a day for parlor installations with lines ranging from 35 to 100 feet in length.

Estimating Hot Water Requirements (with pipeline)

1. For around-the-barn pipeline milking systems using "air and water" cleaning, allow 7-9 gallons for each 100 feet of line and calculate the needs for other routine cleaning.
2. For milking-parlor installations using

*Professor, Agric. Engineering, Cornell Univ.

the "air and water" method allow 10 gallons for each washing of a 30-foot line and 17 gallons for a 100-foot line. Then calculate the needs for other routine cleaning.
3. Pipeline systems using the "filled" water method will need to be calculated for volume requirements as recommended by the manufacturer.

An example of estimating the gallons of 150° water required for an around-the-barn pipeline system with 50 milkers follows:

Assume 250 feet of line cleaned by the "air and water" method and a 600-gallon tank.
1. Allow 7 gallons of 150° water for washing each 100 feet of pipeline = 18 gallons.
2. Calculate amount of 150° water needed to blend with 35° water to make 18 gallons of 90° sanitizing solution:

$$\frac{90 - 35}{150 - 35} \quad \frac{55 \times 18}{115} = 8.6 \text{ gallons}$$

3. Calculate amount of 150° water needed to blend with 35° water to make 18 gallons of 110° rinse water:

$$\frac{110 - 35}{150 - 35} \quad \frac{75 \times 18}{115} = 11.75 \text{ gallons}$$

4. Allow 1/5 of a gallon of 150° water per cow for udder washing and teat cup sanitizing = 10 gallons.
5. Allow 2 gallons per 100 gallons of dry-wall bulk tank = 12 gallons.

Summarizing:

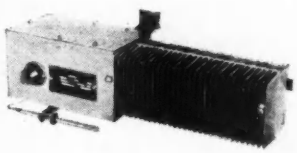
	Gal.
Washing pipeline twice a day: 2 × 18 =	36
Sanitizing pipeline twice a day: 2 × 8.6 =	17.2
Rinsing pipeline twice a day: 2 × 11.75 =	23.5
Washing udders twice a day: 2 × 10 =	20
Washing and sanitizing bulk tank: =	12
Total on day bulk tank is washed: =	108.7

This total exceeds the average found in the study because some dairymen were using cold water to rinse the pipeline and some were washing the pipeline after the morning milking only.

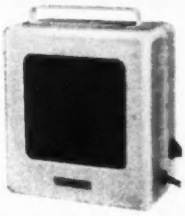
After estimating number of gallons of hot water required, the size of the electric water heater can be selected. A well-designed electric heater should deliver 90% of the rated storage capacity on continuous capacity with no more than a 2°F drop from the controlled temperature. If the heater does not have a well-designed cold water inlet baffle or the water in the bottom of the tank is not heated, only 75 to 80% of the tank capacity is available before a serious drop in temperature will occur. □ □

MEET YOUR HEATING PROBLEMS
ACCURATELY, ECONOMICALLY
WITH SAFE ELECTROMODE HEAT

Electromode promises you all the heat you need all around the farm . . . without the haunting nightmare of fire.



An Electromode Pump House Heater, silently and without any attention on your part, stands guard day and night to keep the pump house safely above freezing without wasting heat.

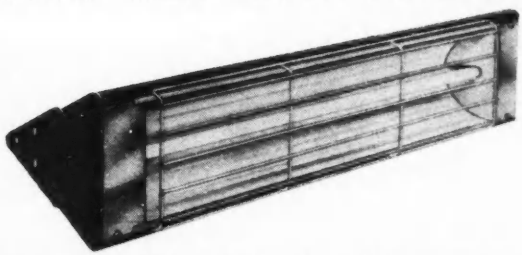


An Electromode Milk House Heater is thermostatically controlled to keep the milk house at the desired temperature regardless of the cold outside.

BOTH ARE FIRE SAFE

In both the milk house and the pump house heater the current-carrying and heat-emitting wires are enclosed in a solid cast-aluminum grid which can never be shorted, which never gets hot enough to ignite even a wisp of hay.

INSTANT HEAT–EVEN OUTDOORS



There are a dozen places around the farm where you can use the Electromode Quartzone Tube Infrared Heater. Provides instant heat in a limited working area even in exposed areas. Like the sun's rays, it warms you without warming the air.

® Electromode

Call your Electromode dealer or contractor, or write:

Dept. EF-20

Division of Commercial Controls Corporation, Rochester 3, New York

Now Poultrymen Are . . .

There was a time when egg collecting was the big bottleneck in otherwise fully-mechanized poultry operations. Today, mechanized egg collecting is here.

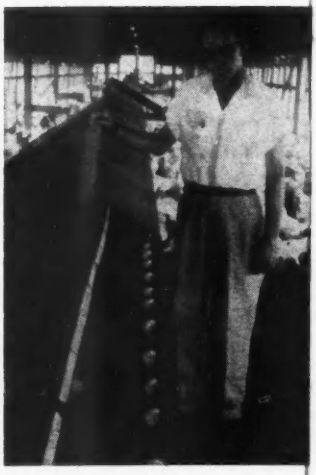
Research has shown that the mechanical egg collector can reduce the time for this chore by as much as 60%. By connecting the grader to the end of the collecting belt another step may be saved, and all the poultryman has to do in this case is pack the eggs. In any case, mechanical collection has that one big plus —eggs are brought automatically to a central collection point.

Mechanical egg collecting is easily adapted to floor-type houses if enough of the special nests (one for every 4 or 5 layers) are provided and the birds are trained not to lay on the floor. Floor operations use an egg collecting belt that works in conjunction with nests that roll eggs toward the front or rear. Some units have a metal cover over the belt to protect eggs.

With caged layer operations, mechanical egg collection becomes even easier, since every egg is mechanically collected. One unit, built especially for colony cages, uses a belt conveyor running at 15 ft./min. between two rows of cages. A square table on the end of the conveyor accumulates the eggs for counting and crating.

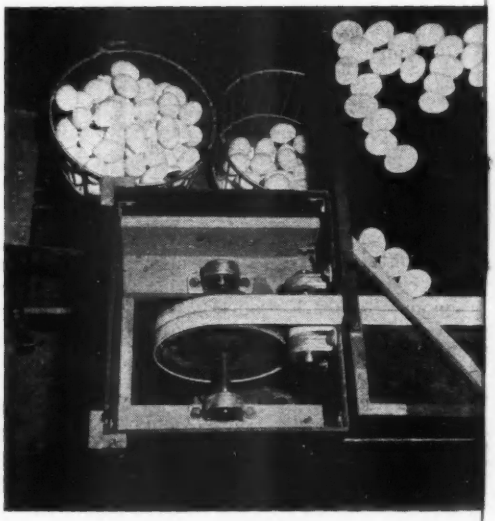
The mechanical egg collector has just about completed the total mechanization of the poultry houses. It saves time and work. Now the only step left for total chicken-to-distributor automation is a system of conveyors that will connect egg collector, grader and packing machine. Agricultural engineers and poultrymen are working on that right now. □ □

Belt conveyor egg gatherer collects eggs from double row of colony cages on Raymond Corll farm, Columbiana, Ohio. The Corlls gather 1800 eggs daily from the two double rows of cages in a total of 36 minutes. It takes Mrs. Corll (counting eggs in photo) an hour to collect 400 eggs in another house by hand.



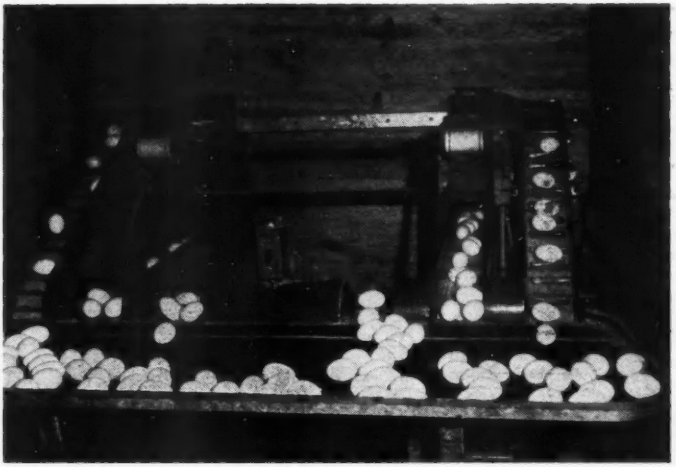
Roll-away nests deposit eggs on mechanical collector's canvas belt at Texas Farm Products, Nacogdoches, Texas. Covers have been lifted to show belt.

GATHERING



Two simply-designed egg collection units on Marshall Bros. Farm, Ithaca, N. Y. gather eggs from 10,000 hens. Collectors run continuously from 6:45 a.m. to 4:30 p.m. to bring eggs into this refrigerated egg room immediately after they are laid. Installation cost for nests and gatherer averaged about 20¢ per hen. Canvas belt of Marshall's unit is driven by ¼ hp motor. Belt carries eggs to table where slight slope rolls them gently to side. Cracks average less than 1%.

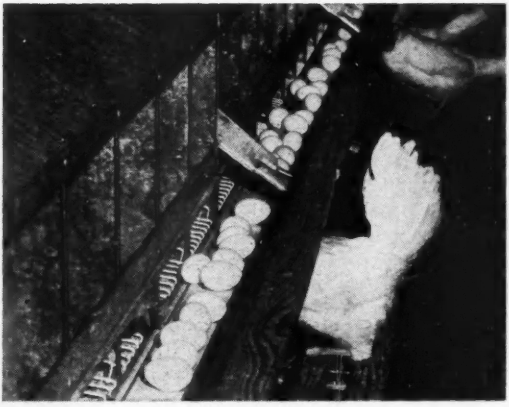
By HUGH J. HANSEN



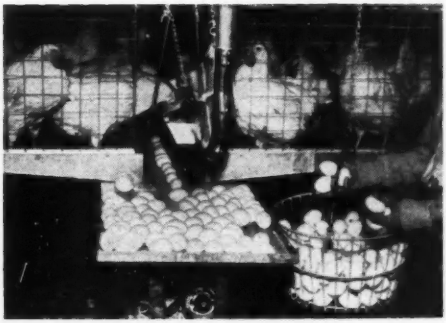
Three-tier collector is used on Noah Beachy Poultry Farm, Meyersdale, Pa. Outside conveyors bring eggs from top tier, middle conveyors from center tier, and inside conveyors, on either side of switch, from bottom tier. Plastic flights on inclined belts prevent egg breakage. Belts are continually cleaned as they move by stationary brushes.

Same conveyor that moves feed to hens also collects eggs on return trip around in caged layer house of V. T. Henderson, Cleburne Co., Ala. Three-tier arrangement fits special type of cage. Top tier is waterer, center is endless conveyor which carries feed out and brings eggs on return along lower tier. System is estimated to cut egg-gathering time by 50%.

EGGS MECHANICALLY



Front-sloped roll-away nests are used on Melvin Starner farm, New Oxford, Pa. Egg collection belt in front of nests has metal cover that has been removed for photo. He uses over 2000 nests for his 10,000 layers to prevent birds from laying on floor.



Eggs are collected on Elmer Gemberling's 3600-bird poultry farm at Kent, Ohio by mechanical belt conveyor. Here, eggs are being picked up from collecting table at end of mechanical gatherer. Gemberling's 17-year-old daughter says she can completely care for entire mechanically-fed and watered operation in 1½ hours a day.

Wire Sizes for Single Phase Farm Motors

Motor H.P.	Full Load Amperes*	Minimum Allowable Size Copper Wire				Distance (Feet) from Service Entrance to Motor** Types R, T, TW, RH															Motor H.P.
		In Cable, Conduit, or Earth		Overhead in Air†																	
	115 volts	Types R, T, TW	Type RH	Type WP	Type TW	0-20	30	40	50	60	70	80	100	120	140	160	200	240	280	320	360	
¼	5.8	14	14	10	10	14	14	14	14	14	14	14	12	12	10	10	10	8	8	8	6	¼
⅓	7.2	14	14	10	10	14	14	14	14	14	14	12	12	10	10	10	8	8	8	6	6	⅓
½	9.8	14	14	10	10	14	14	14	12	12	10	10	10	8	8	8	6	6	4	4	4	½
¾	13.8	12	12	10	10	14	14	12	10	10	10	8	8	8	6	6	4	4	4	2	2	¾
1	16.	12	12	10	10	12	12	12	10	10	8	8	8	6	6	6	4	4	2	2	2	1
	230 volts																				
¼	2.9	14	14	10	10	14	14	14	14	14	14	14	14	14	14	14	12	12	10	10	10	¼
⅓	3.6	14	14	10	10	14	14	14	14	14	14	14	14	14	12	12	10	10	10	8	8	⅓
½	4.9	14	14	10	10	14	14	14	14	14	14	14	12	12	10	10	10	8	8	8	6	½
¾	6.9	14	14	10	10	14	14	14	14	14	14	12	12	10	10	10	8	8	6	6	6	¾
1	8	14	14	10	10	14	14	14	14	12	12	12	10	10	8	8	8	6	6	6	4	1
1½	10	14	14	10	10	14	14	12	12	10	10	10	8	8	8	6	6	4	4	4	4	1½
2	12	12	12	10	10	14	12	12	10	10	10	8	8	6	6	6	4	4	4	2	2	2
3	17	10	10	10	10	10	10	10	10	8	8	8	6	6	4	4	4	2	2	2	1	3
5	28	8	8	10	10	8	8	8	8	6	6	6	4	4	2	2	2	1	0	0	2/0	5
7½	40	6	6	10	8	6	6	6	6	4	4	4	2	2	2	1	0	2/0	2/0	3/0	3/0	7½
10	50	4	6	8	6	◇	◇	◇	4	4	4	2	2	1	1	0	2/0	3/0	3/0	4/0	4/0	10

Wire in overhead spans must be at least No. 10 to stand wind and ice conditions.

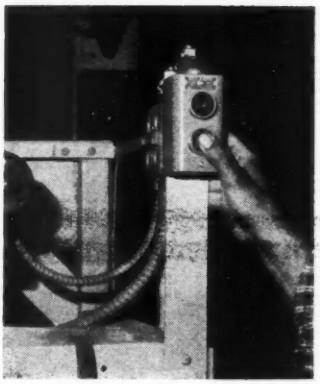
†When distance between supports of the span is over 50 feet, No. 8 is smallest size allowable.

*Motor currents given above are taken from the 1959 Edition of the National Electrical Code.

**Table based on 10 volt maximum drop on starting.

◇ #4 Type R, T, TW or #6 Type RH

Part 4 of a "total coverage" series on . . .



FARM ELECTRIC MOTORS

How to Select Wiring for Motor Circuits

By ALBERT MORRIS, JR., and ART RADWIN

Installation of small electric motors operating on 115 volts is fairly simple. But motors of ½ hp and larger should operate on 230 volts and should have individual branch circuits. This kind of installation is more difficult. It begins with the disconnect which is the means whereby all hot wires serving the controller and motor are disconnected from the power source. Under certain conditions the disconnect switch also may be used as the controller and its overload device selected to protect both motor and wiring. The disconnect switch ampere rating should be at least 2 times and preferably 3 times the full load current for the motor shown in the table on opposite page. For motors 2 hp and larger, choose either a circuit breaker or motor circuit switch with a hp rating not less than that of the motor.

Branch Circuit Wire Sizes

The National Electrical Code places certain limits on the amount of current (amperes) that different sizes of wire can carry with different types of insulation. The purpose of these limitations is to prevent damage to the insulation from overheat. Information from several tables in the 1959 edition of the Code has been condensed into the table shown on the opposite page to simplify selection of wiring circuits.

Several types of wire are mentioned in the table. Wires used in most of the Type UF plastic covered cable and in ordinary nonmetallic sheathed cable are either rubber covered Type R, or plastic covered Type T or TW. In service entrance cables, which are often used for supplying the larger motors, rubber insulation Type RH (heat resistant) is common. For overhead spans outdoors, either weatherproof wire Type WP with impregnated cotton braid or Type TW with plastic insulation are used.

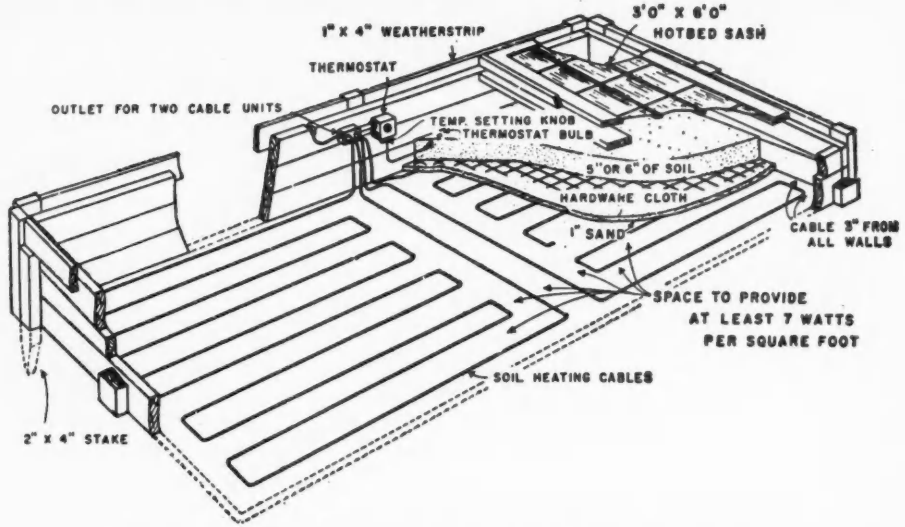
The minimum allowable sizes of wire given in this table are large enough to carry the currents shown without overheating the insulation. *For distances over 40 feet it will usually be necessary to use larger wire sizes shown on right hand section of the chart so as to deliver the current at the proper voltage.* (The full load current of the largest motor on the circuit is multiplied by a service factor of 1.25 to help take care of the higher starting current needs.)

Sample Calculation

For example, let's take a 5 hp farm motor and see what size wire is needed to supply it. The table shows that No. 10 wire is the smallest allowable outdoor feeder, provided spans do not exceed 50 feet. No. 8 wire is the smallest allowable size in cable, conduit or earth. Therefore No. 8 is the smallest size that should be used for the branch circuit wiring. However, note that No. 8 wire is not suitable for branch circuit distances over 50 feet. A distance of 100 feet, for instance, calls for No. 4 wire. Since this is larger than No. 8 required by the Code, it should be used to provide satisfactory maintenance of voltage.

Overload protective devices for the branch circuit usually are fuses or circuit breakers. They should be of the time-delay type and should have the same rating as the branch circuit wires chosen by method above.

Next Month:
Motor Controllers and Overload Protection



TYPICAL HEATING-CABLE HOTBED SETUP

Hotbed-Started Tomato Plants Are

•Vigorous

•Economical

Farmers in Virginia's Hanover county have earned a wide reputation for growing fine tomatoes. Their target is the early season market and top prices. Having healthy, vigorous plants to put into the fields as soon as the danger of a killing frost is past is mighty important to them.

Traditionally, these farmers used manure plant beds. But with the mule vanishing from the farm scene, manure has become scarce and expensive. This set the stage for a trend to electric hotbeds.

One of the first electric plant beds was installed by G. B. Barker of RFD 3, Richmond, who has been growing tomatoes 35 years. He prefers the electric bed over the old manure type for these reasons:

• By regulating the soil temperature, he says he can control the size of plants. Manure beds tend to produce a spindly, big plant, and if the plants get too big before they are transplanted they usually do not make as good a crop. In the electric bed, he sets the thermostat at 70° F. until the plants are up, then steps it back to 65° and 60°.

• The electric bed has always produced a good crop of plants. He says his manure beds sometimes "burned."

• The electric bed requires less labor and, considering that he would have to buy manure, it is cheaper, too.

Barker's bed is 50 x 6 feet. It has 3200 watts of soil heating cable (four 120-foot 800-watt lengths) and yields about 15,000 tomato and pepper plants. He puts the seed in rows and prefers to wait until the plants are up to begin watering. Original cost of the plant bed, Barker says, was about $150. This included switches, thermostat and extending electric service to the bed.

This permanent type unit has the soil heating cable embedded in a layer of sand with a protective layer of hardware cloth about ½ inch above it. The hardware cloth will prevent damage to the cable when the bed is being cleaned.

On top of the hardware cloth is 5 to 6 inches of good soil into which the seed is planted. The beds are covered with glass sash. □ □

Finer Carolina FARM NEWS
PUBLISHED BY
CAROLINA POWER & LIGHT COMPANY

Logical Conclusion

It would be refreshing if the advocates of "cheap" government-produced and distributed electric power would pursue their arguments to the logical and inescapable conclusion.

This "cheap" power, they tell us, is a boon to the home-owner, the farmer, and to business, and is a magnet when it comes to attracting new industry to a region. And, they go on, power at such low rates is possible only in a government undertaking.

Well, there's a good deal of question as to just how much "cheap" power means to people. The cost of electricity runs to only about one per cent of most household and business budgets. But that aside, the reasons why government power is "cheap" should not be overlooked. First, government systems either pay no taxes whatever or comparatively small sums in lieu of taxes—whereas taxes take close to a quarter of all the revenues of the business-managed utilities. Second, government systems get their capital from the Treasury, either without interest or at below-market interest—whereas the private utilities must pay the going rate. Third, if government systems don't make both ends meet, the difference is made up by appropriations which increase the taxes of taxpayers everywhere, whether or not they use the power.

Under those conditions it is obvious that government could sell everything and anything cheaper—including all the things which are infinitely more important cost-wise, than electricity. So why don't the public-power people advocate that government provide food, transportation, insurance, housing, clothing, entertainment, and everything else on the same tax-free, tax-subsidized basis—and then boost prices in lieu of taxes?

If this happened, we would have an economy and a system of government indistinguishable in all important ways from the Soviet economy and system of government. And that's the direction in which socialized power carries us.

Yes, let's carry the "cheap" power argument to its logical conclusion.—**Industrial News Review.**

Fooling The People

Judging by what the socialized power groups say, with their clamor for more and more tax-free, tax-supported government projects, the cost of electricity is a very important item to the consumer.

If you believe that, some figures taken from the official government Consumers Price Index will be both startling and revealing.

In a recent month, electricity took less than one per cent out of each dollar spent by consumers, 9/10th of one per cent, to be precise.

By way of comparison, cosmetics, which are hardly a vital necessity, desirable as they may be, took exactly the same percentage of the dollar. And consumers spent 4.3 per cent of their budgets on alcoholic beverages and tobacco, or five times as much as they spent for the power services that lights their homes, and operates all manner of conveniences.

The cost of electricity is one of the least of items to the average family. Nothing they buy is a better bargain, or provides so much comfort and well-being for so little money. And the same thing is true for business, industry and agriculture as a whole.

Why, then, should there be so much agitation over the public vs. private power issue? The answer is simple. If the politicians and the bureaucrats can control and monopolize the country's vital power supply, they can boss everything. The way toward general socialization of enterprise will be wide open. So the power fight is not economic in nature, it's 100 per cent ideological and political.—**Camden (S. C.) Chronicle,** Oct. 19.

WATER WARMERS MAINTAIN EGG PRODUCTION IN FREEZING WEATHER

BY BURWELL SMITH, CP&L Agriculture Agent

"We have never tried to put a value on what water warmers mean to us in our laying operation," Bob Francis told us. "We know that when the weather gets really cold, we have to have them. Otherwise our hens would just about quit laying."

He told us that last winter the outside temperature of his poultry farm dropped to ten below zero. Inside the houses, the temperatures dropped to zero. Without water warmers in the watering troughs his hens could have gotten no water at all. "After all a hen can't drink ice."

With the water warmers, most of his waterers continued operation. Some waterers without warmers stayed frozen for three days. His water warmers were built to hold the water unless the temperature dropped below 10° F. Thus, when it dropped another 10 degrees inside the house, the warmers had done more than expected.

INSTALLING WATER WARMERS—James Junior Ruff is shown installing water warmer on R. H. Francis Farm, Haywood County. Without warmers water stays frozen sometimes for several days and hens quit laying.

Eggs are nearly 90% water. Thus the hen must have a lot of water to produce eggs. If it is ice, she cannot drink it. If it is near freezing, she does not like to drink it and will drink much less than she needs. Then the number of eggs start dropping rapidly. As Bob told us, if your egg production stops, you are just boarding some hens, not using them as an income producer.

Bob now has 10,000 hens in production, producing eggs that are hatched and grown as broilers. The eggs from one of Bob's flocks are sold to a hatching egg broker in Buncombe County. The others go to a hatchery on the Eastern Shore of Maryland. From both areas they go to widely scattered broiler producers, then to processing plants from Maine to South America.

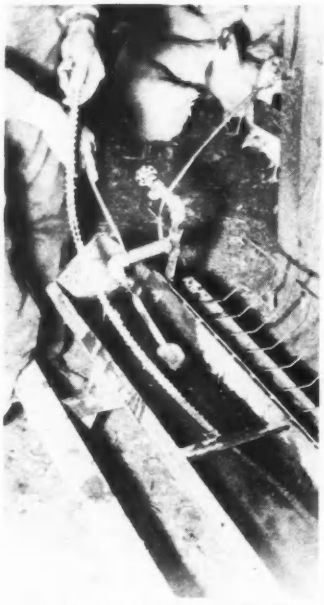
Thus by using water warmers that keep the water at a temperature the hens can drink it, Bob Francis and other poultrymen keep the poultry industry chain moving at all times. The egg is the basis for the broiler industry. So, water warmers are important not only to the hatching egg producer, but to the broiler grower, the processor, the retail merchant, and even the feed dealer and equipment salesman.

Temperature plays an important role in many phases of the poultry industry. Not only must the water be kept warm in the cold weather, but the egg must be kept cool the year round. An egg room cooler keeps the temperature and the humidity of Bob's egg room right all year. He even has to add heat to it at times, using infra-red lamps to warm those persons grading and packing eggs. While we were there, the temperature of the egg room was all right for egg and humans without taking any heat out of the room or adding any heat for his workers.

Even the hens get too hot at times—during the hottest part of the summer. One of his houses will have to be equipped with exhaust fans if he continues to use is as a laying house. If he uses it to grow pullets, he will have the pullets on the range during the summer. But otherwise, fans to move the hot air out will have to be installed.

Bob uses six foot waterers for his hens. A plastic heating cable about 8 feet long is used in each waterer. Six feet of it has some heavy wire on the cable to hold it in the water. The remainder is wrapped about the pipe and the valve of the waterer so that neither will freeze. This cable can be bought in lengths that will fit any long waterer. It should not be cut since it is standardized for heat that will keep the water at the right temperature.

The cable water warmer comes in several types. All types are made in several different lengths. The dealer can supply any poultryman with a water warmer that will fit his needs and fit any size or type of waterer. Warmers for the round or rectangular waterers are on the market. Most of these need a thermostat, but one thermostat can control several warmers. Most water warmers are plugged into a convenience outlet, but Bob found that the hens pulled his out by sitting on them. For this reason, he wired them permanently to his electrical system so that he did not have this problem.



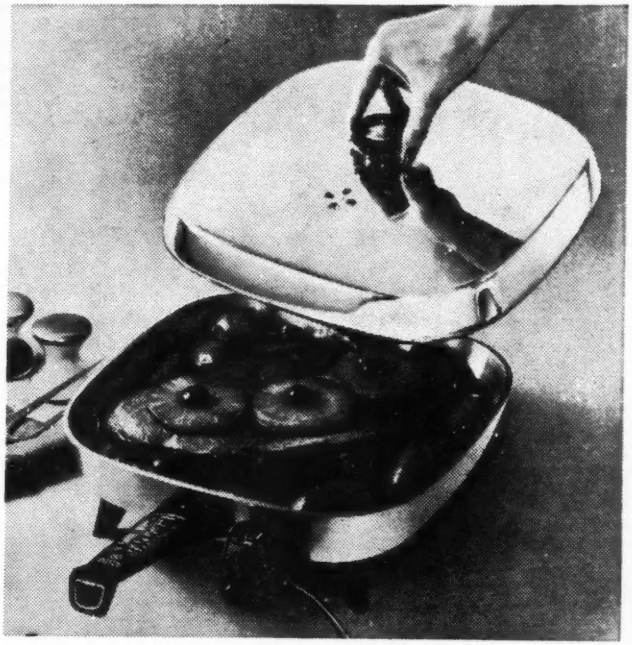
HEATING TAPE PREVENTS FREEZING — Tape is wrapped around pipe of waterer to keep it from freezing. Wire shown wrapped around tape makes it heavy enough to submerge in the water and keep it from floating.

SOME HELPFUL HINTS ON USING YOUR TABLE APPLIANCES . . .

New Uses For That Skillet, Deep-Fat Fryer or Blender You Got As A Christmas Gift!

BY LANE SILER

Home Service Representative



Your home is typically American if you received as a Christmas gift one of the sixty-five portable electrical appliances on the market today. Have you checked recently to see just how many of these servants are working for you?

These "portables" are small, lightweight and sleekly styled. Using them you marvel at how you managed before their day! They make housekeeping more efficient and comfortable and entertaining much less effort.

As "table appliances" their styling, low table-top temperatures and cool-to-the-touch handles make buffet meals or sit down meals a real joy to the hostess (who is easily the cook) and her guest. For with them food can be cooked in and served from them wherever there is an appliance outlet. Then they are on "stand-by" to keep the food hot until serving time or for second helpings.

You may still be displaying these wonderful portable appliances with joy and pride. Now with Christmas over, do not tuck them away on a shelf or in a hard-to-get-to corner, forgetting that they are designed to save you time and effort throughout the day. Remember their middle name should be "versatility" for each of them is so versatile. Check your Instruction Book for all the uses. Listed below are some of the uses of the electric skillet, Deep Fat Fryer and Blender.

Skillet

Panbroiling, frying, braising, and grilling

Cooking one-dish meals

Baking potatoes, apples, upside-down cake, custards

Long, slow cooking of spaghetti sauce, baked beans

Crisping cracker, cereals, potato chips

Making fudge—salted and glazed nuts

Cooking fresh and frozen vegetables

Defrosting frozen vegetables or meat

Popping corn – keeping foods warm—heating rolls

Deep-Fat Fryer

Deep-fat frying meat, fish, fowl, fritters, croquettes

Browning, braising, and stewing meats and fowl

Cooking casserole dishes and one-dish meals

Cooking vegetables, cereals, fruit, soup, spaghetti

Steaming puddings, custards, and brown bread

Popping corn—warming rolls

Long, slow cooking of baked beans, spaghetti sauce

Making candy and icings

Keep-warm appliance for buffet and patio meals

Blanching vegetables for freezing

Defrosting fruit, vegetables, and meat

Blender

Mixing quick breads, cakes, cookies, pie crust, pancake and waffle batter

Making marmalades, jams, conserves, relishes

Making soups, mayonnaise, sauces, icings, baby foods

Raw fruit and vegetable cocktails

Beverages—milk shakes, egg nogs, snows, and ices

Chopping nuts, parsley—making grated coconut

Making powdered sugar from granulated sugar

Making bread, cracker, and cookie crumbs

Blending meats to pulp for canape spreads

Making nut butters—peanut, walnut, cashew

Mashing potatoes—shaving ice

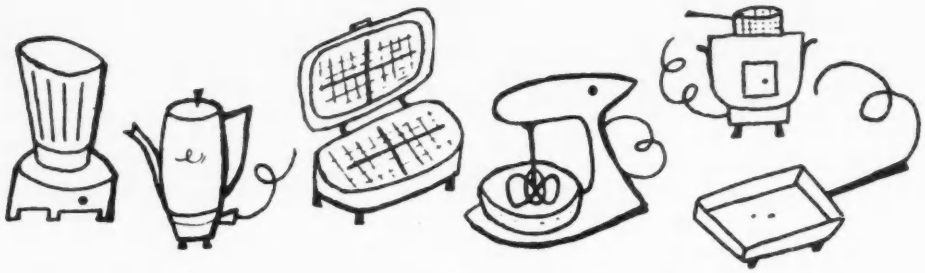
Whipping cream—on two-speed blender using Low

Reconstituting dry milk solids, frozen fruit juices

Making whipping cream into butter

Now that you own and use them with pride and enthusiasm, care for them in the same manner. Make sure they get all the electricity they need for their efficiency and durability. Slow heating, or a blown fuse or tripped circuit breaker is evidence that the circuit into which the appliance is plugged is overloaded. Amazingly, this over-

(Continued on Page 18D)



Put Your New Christmas Portable Appliances To Work

LANE SILER, Home Service Representative

SKILLET FRIED CHICKEN

1½-2 lb. frying chicken, cut in pieces
½ cup all-purpose flour
1½ tsps. salt
⅛ tsp. black pepper
1 tsp. paprika
4 tbsps. shortening or salad oil

Wash and dry chicken pieces thoroughly. Mix together flour, salt, pepper, paprika. Dredge chicken pieces in flour mixture. Pre-heat skillet at 400° F. Melt shortening and add chicken, doing breast and leg pieces first. Brown. Remove and brown remaining pieces. Place all chicken in skillet. Cover. Reduce temp. to 250° F. Continue cooking 15-20 minutes or until tender. Makes 3-4 servings.

GRIDDLE FRIED APPLE RINGS AND SAUSAGE

2 pkgs. Brown 'n Serve Sausages
3 medium size apples

Core and slice apples in ½ inch thick slices. Set griddle control at 350° F. Place sausage on one end of griddle and apple ring on other end. Before placing apple slices on griddle, grease griddle lightly with shortening or butter. Cook apple rings about 3 minutes on each side. Sprinkle with powdered sugar before serving. Sausage should be browned lightly on each side.

BLUEBERRY PANCAKES

2 cups sifted flour
4 teaspoons baking powder
1 teaspoon salt
3 tablespoons sugar
½ teaspoon cinnamon
2½ cups milk
2 eggs, separated
4 tablespoons melted butter or margarine
1 cup blueberries, canned or frozen, well drained

Combine dry ingredients, mixing well. Stir in milk and egg yolks; add melted butter and blueberries. Beat egg whites until stiff; fold into batter. Preheat skillet to 380° F. Pour on batter and bake until puffed and bubbly; turn and brown second side. Serve hot with butter and syrup. Makes about 24 3-inch pancakes.

FRESH TOMATO ASPIC

1 pound tomatoes
1 small onion
¾ cup cold water
1 envelope unflavored gelatin
1½ teaspoons salt
1 tablespoon lime juice
½ teaspoon Worcestershire sauce

Wash tomatoes and remove stem ends. Slice tomatoes and onion into saucepan. Add ½ cup of the water. Cover and bring to boil. Cook 3 minutes. Pour into glass container. Cover container and turn on Blender. Run until tomatoes are smoothly blended (about 10 seconds). Soften gelatin in remaining ¼ cup water for 5 minutes, then dissolve over low heat. Add to tomato mixture. Add salt, lime juice and Worcestershire sauce. Mix well and pour into lightly oiled 3 cup ring mold, or 6 individual ring molds. Chill until firm. Unmold on crisp salad greens. Accompany with cottage cheese. Makes 6 servings.

SOME HELPFUL HINTS

(Continued from Page 18C)

loaded circuit is usually the rule rather than the exception for ten to twenty years ago we could not foresee the electrical loads homes would use today. Surely you would start 1960 off with a bang by having an electrical contractor check your home for adequate housepower and rewire for your present as well as future needs.

Further care for your portable appliances by plugging them directly into an outlet. If an extension cord must be used until rewiring (and I strongly discourage its use) make sure the extension cord wire is the same size as the wire of the portable appliance you plug in. Otherwise your portable will get only a trickle of electricity, decreasing its efficiency and life.

For long life of the plug, when you unplug the appliance, do so first at the outlet before the appliance connection. This increases the life of the magnetic in your plug.

You can keep these portables new looking forever because they are easy to clean. Many of the newest ones (used for cooking, that is) have removable heat controls so the entire pan can be immersed in hot detergent water. Should food stick, simmer soap and water in pan to soften and finish off with a fine steel wool pad. To remove finger prints or grease smudges on the outside, add household ammonia to your hot detergent water.

As you enjoy the use and care of your new portable electric appliances, 1960 should be a year of greater homemaking for you. Be on the lookout for other "portables" to add to your comfort and convenience. (If an electric can opener wasn't one of your gifts, you will want one. Hope you won't have to wait 'til next Christmas for it and many other electric portable time savers!)

RESEARCH NOTES

By J. P. SCHAENZER

Electric-hotbed-grown sweet potato slips were up in 9 or 10 days and ready to set in the field 27 days after seed potatoes were planted.—*Louisiana State Univ., C.J. Tassin, Jr.*

Cottonseed can be tested electrically in the laboratory, and the percent germination and seedling vigor predicted in 15 minutes.—*USDA, ARS, J.T. Presley*

Turkey poults grown on a raised wire floor gained 25% more than those raised on other kinds of litter.—*Univ. of Nebraska, H.L. Wiegers*

The farmer's share of the consumer's food dollar has dropped from 40¢ in June, 1958 to 38¢ for the same month in 1959.—*USDA*

Electric heating will cost less on sunny winter days when outside dwelling walls are dark-colored, but dark walls may mean higher air-conditioning costs in summer.—*Mississippi Agric. College, Jack G. Griffin*

Under experimental conditions, the maximum daily gain of hogs was greatest at a constant air temperature of 61° for 350-lb. hogs and at 73.5° for 100-lb. pigs.—*Univ. of Calif., Davis*

A 5 hp unloader used 994 KWHrs removing 225 tons of silage from a 16-ft. silo.—*Univ. of Wisc.*

Croft lily bulbs should be refrigerated at 31°F to 45°F up to potting time to secure uniformly tall plants with the most blossoms.—*North Carolina Agr. Exp. Sta., J.B. Gartner and Charles A. Jackson*

A California farmer placed a blue-bulb light trap in a field of artichokes to indicate the appearance of the plume moth—a signal to start spraying. Result: 2 to 16% wormy artichokes; no trap: 40-70% wormy.—*Univ. of California, R.G. Curley and R.R. Parks*

Mace, allspice and nutmeg tend to develop strong and objectionable bitter flavors in frozen foods because the oils continue to be extracted into the product.—*Univ. of Massachusetts*

The average number of pigs saved per litter in the spring of 1959 was 7.08. This was second only to 1958 and 12% larger than 1950.—*AMS., USDA*

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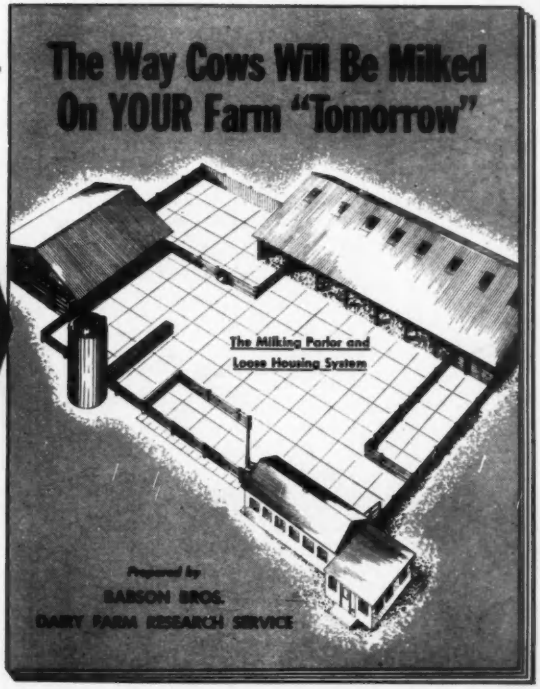
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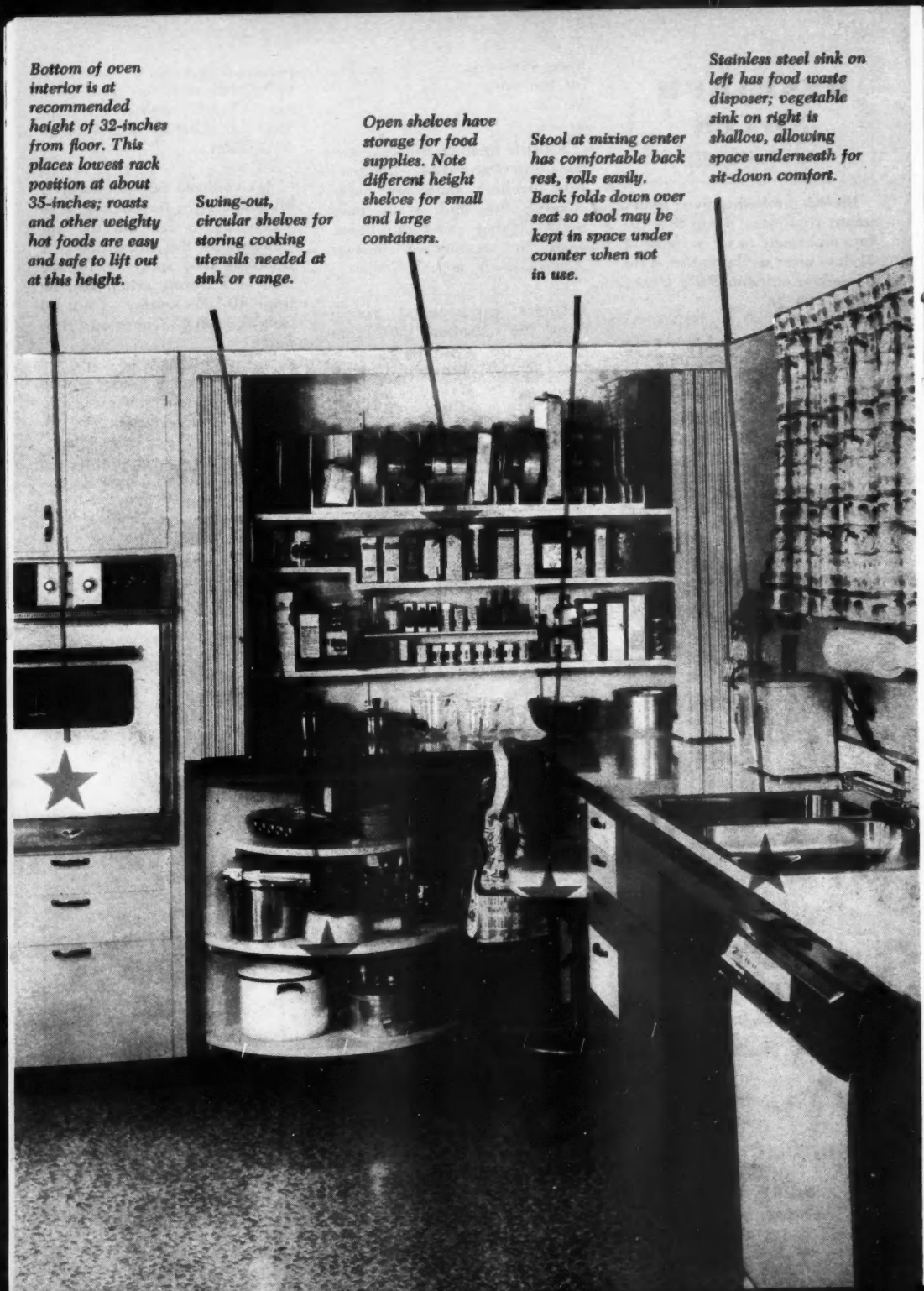
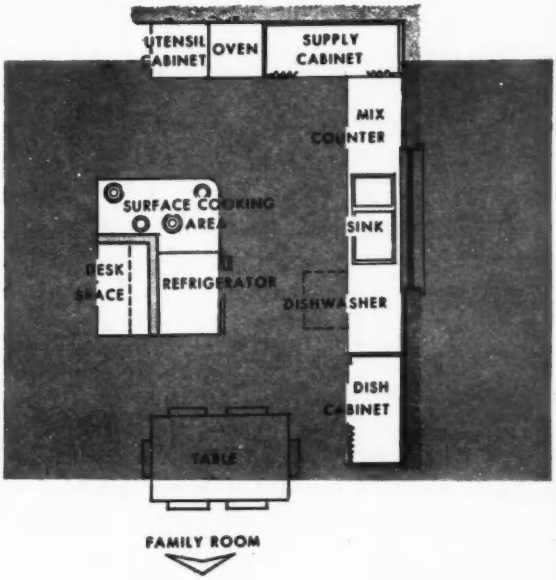

Bottom of oven interior is at recommended height of 32-inches from floor. This places lowest rack position at about 35-inches; roasts and other weighty hot foods are easy and safe to lift out at this height.
Swing-out, circular shelves for storing cooking utensils needed at sink or range.
Open shelves have storage for food supplies. Note different height shelves for small and large containers.
Stool at mixing center has comfortable back rest, rolls easily. Back folds down over seat so stool may be kept in space under counter when not in use.
Stainless steel sink on left has food waste disposer; vegetable sink on right is shallow, allowing space underneath for sit-down comfort.

plan your kitchen to save YOU

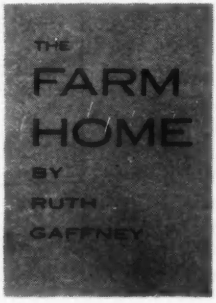


We had the privilege recently of visiting USDA's Institute of Home Economics at Beltsville, Maryland, where studies have been under way to determine how a well-planned kitchen can save energy. While primarily they had in mind a kitchen for use of women who are older or who are physically handicapped, their suggestions will be of interest to every homemaker.

It was pointed out that there are no hard-and-fast rules for planning a kitchen. No two women are exactly the same size, no two households have exactly the same needs. Their findings, however, serve as a valuable basic guide for family-planned kitchens.

How to save energy was their prime consideration; organization of the kitchen was secondary, but it contributed importantly to to their results.

We believe you will want to study this kitchen worked out by the experts and see how much of their organization you can put into your own kitchen. The kitchen in which they did their study *(Left)* is in pleasing colors of light gray, yellow and white. All cabinets are custom-built to incorporate dimensions found to be the easiest to use. Appliances include the basic electric refrigerator, built-in oven and separate surface units, automatic dishwasher and food waste disposer.



What the experts learned about the energy you use. You will understand that it is not just one motion, or function, that is emphasized here but an accumulation of motions that use up your energy when preparing a meal. In other words, the more *motion* a well-organized kitchen can save you, the more *energy* you can save.

For instance:

Higher up you reach, the more energy you use. For average woman ("average" is about 5′ 3″ tall) shelves more than 68-inches above the floor should not be used to store often-needed items because they are too difficult to reach.

A good rule of thumb: store frequently-used items on shelves *not less* than 28-inches, nor *more* than 52-inches, from the floor. Shelves at heights outside these limits require more energy. Work surface 36-inches from floor is a convenient height. If you sit down, for time-consuming tasks, such as preparing vegetables and fruits for canning, you'll be energy ahead.

when planning a kitchen . . .

IT'S SMART to provide counter space next to refrigerator. You'll need it when putting in or taking out food.

Door of refrigerator should open so that you don't have to walk around it to take something out. When buying a new refrigerator, insist upon a right or left-hand-hinged door, whichever suits your needs. All manufacturers now provide this choice in their models.

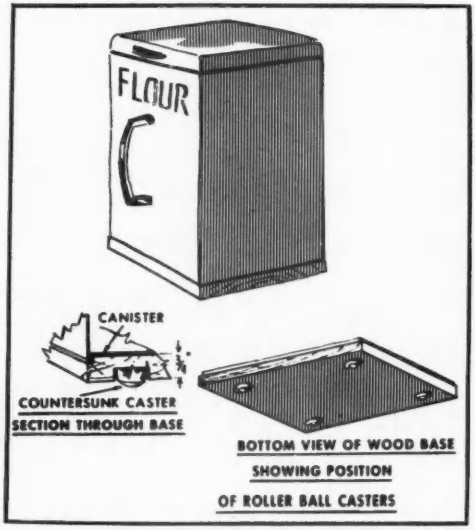
Preparation area should be compact to give greatest convenience and energy-saving. Popular arrangement is "U"-shaped kitchen with refrigerator on left, range on right and sink between the two.

Good light is important. It should be sufficient for each work area but at same time not so much light that it takes away the charm. It's a good idea to have both fluorescent and incandescent—fluorescent is cooler, you get a greater amount of light at less cost; incandescent softens colors in food and decoration.

Labor-saving appliances have made the kitchen the noisiest room in the house. Acoustical tiles on ceiling to absorb sound are the ideal answer.

Easy maintenance is of prime importance and much study has gone into this problem. Hard surface floor coverings, plus plastic countertops (and wall coverings, too) seem to be best solution. Wearing qualities of these products vary. It is not always the most economical to buy the cheapest; you may have to replace them within a short time.

WORKING DRAWINGS of this kitchen (not including cabinets) incorporated in USDA house plans Nos. 7149 and 7152, are available through your county agents or from extension agricultural engineer at most State agricultural colleges. There is usually a small charge.



Good idea: *place large canisters for flour and sugar on a rolling platform to make them easy to move around. Wood base is cut to exact size of canister; countersink a roller ball caster in each of four corners, paint to match color of canister.*

Automatic electric dishwasher is close at hand when soiled dishes are cleared from dining table; also convenient to storage section at right.

Simple-to-build wall cabinet, 5-inches deep, stores cleaning supplies needed at sink. Oil, vinegar, seasonings for mixing salads are kept in section at right.

Glassware and china are kept on adjustable shelves of varying depths (heavy plates on lower shelves for greatest convenience). Folding door, when closed, lends neatness to kitchen decor.

Pull-out shelves in lower section of cabinet store electric toaster and other appliances used at table; serving trays have own slot.

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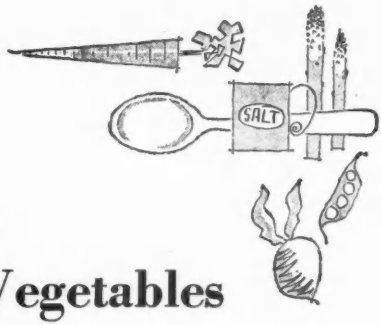

BAKED Frozen Vegetables

Roast day at your house? Put a casserole of frozen vegetables in the oven, too—avoid last minute cooking on top of the range

WHEN WE THINK of Vitamin C we usually think of citrus fruits. But many of our vegetables also contain this easily-lost nutrient. Because our body does not store this essential vitamin, it must be supplied each day in the food we eat.

The National Association of Frozen Food Packers in Washington suggests the following simple method of cooking frozen vegetables. It insures a minimum loss of vitamins and we think the vegetables have more flavor when cooked this way.

Remove solid-frozen vegetable from package, place directly in greased casserole (it's not necessary to cut up frozen block); top with 1 to 2 tablespoons butter and ½ teaspoon salt. Cover and bake at 350° F. for time given in chart below. Stir vegetables 15 minutes before cooking is ended, stir again when ready to serve.

	BAKING TIME (*)
Asparagus	*55 mins.*
Green beans	*45 mins.*
Broccoli	*45 mins.*
Brussels sprouts	*45 mins.*
Cauliflower (add 2 tblsp. milk)	*45 mins.*
Cut corn	*45 mins.*
Collard greens	*45 mins.*
Green peas	*40 mins.*
Kale	*55 mins.*
Mustard greens	*55 mins.*
Spinach	*55 mins.*
Turnip greens	*45 mins.*

(*) Add 10 minutes to above cooking time if cooked at 325° F.

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Space Saving Tips for Your Freezer

By Mrs. Pauline Cox
Portales, N. Mex.

Simple, easy-to-use ideas can conserve freezer space. Here's one where frozen, unbaked pie crusts are stored in flat stacks.

NO MATTER WHAT size freezer we own, it seems we always want a larger one. If this is the way you feel, try the following space-saving tips which have worked so well for me.

Pie crusts are space wasters because of their round shape. To solve this problem, try freezing flat, unbaked crusts. Cut a piece of waxed paper the size of your pan and use as your "pattern". A tripled pastry crust recipe will make 10 or 12 crusts. Roll out mixture and, using the waxed paper pattern, cut crusts. Place two sheets of waxed paper between each crust and wrap entire stack in aluminum foil. Store on flat surface in freezer. These take up space of only one pie.

To remove each crust as needed, separate, using extreme care not to break them. When frozen they are brittle until thawed. Leave crust at room temperature about 10 or 15 minutes, then fit into pie pan.

We all have bursts of economy and the freezer has helped us in that we do not have to throw away those two or three muffins, biscuits or rolls that are left over from a meal. But these odds and ends do have a way of getting lost in the shuffle and cluttering up the freezer. To avoid this, we use grandma's soup kettle method by keeping a large, square covered plastic container in the freezer. Into this we drop all these left-overs. They are in one place and easy to see. With little effort one quick-meal day we pop these into the oven and the family has a treat in a choice of several different kinds of hot breads.

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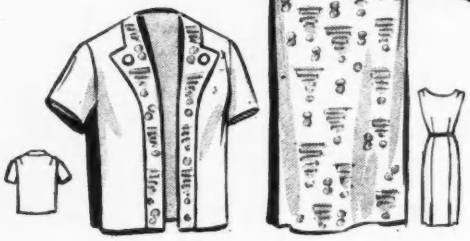
9255
SIZES
12—20
40—42

9032
SIZES
14½—24½

9238
SIZES
12—20
40—42

4866
SIZES
14½—24½

4632
SIZES
10—16



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4632—Sun-time princess style with button-on collarette for "cover-up" occasions. Printed Pattern in Teen Sizes 10-16. Size 12 dress, 5⅛ yards 35-inch fabric; collarette ⅝ yard.

4866—Half-size dress with buttoned bodice, easy six-gore skirt. Printed Pattern in Sizes 14½-24½. Size 16½ takes 3⅝ yards 35-inch fabric.

4898—A slimming sheath that travels everywhere in the smart company of its own jacket. Printed Pattern in Half Sizes 14½-24½. Size 16½ dress and jacket bands take 3¼ yards 35-inch fabric; jacket 1½ yards.

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FOR Junior Partners

Girls Honored at 4-H Congress

Up to 800 lbs. of beef and 200 quarts of fruits and vegetables have been frozen by each of these national 4-H Frozen Foods Program winners. Each received a $400 scholarship sponsored by Whirlpool Corp. Left to right, they are: Patsy Ann Paige, Montana; Lois Ann Jeans, Oklahoma; Jay Zunini, Nevada; Emily Nemeth, New Jersey; Mary Jane Kritzmire, S. Dakota; and Maria Tarczanin, Mississippi.

Here are the 1959 national winners in the 4-H Food Preparation Program: Left to right: Darlene Vogel, Wisconsin; Nancy Mercedes Lee, Virginia; Ada Lous Hartman, Texas; Helen Halliburt of General Mills Home Service Dept.; Sarah Ann Ramsburg, Maryland; Chris Longfellow, Arizona; and Janet Immesoete, Wyoming. Each winner received a $400 scholarship from Betty Crocker of General Mills.

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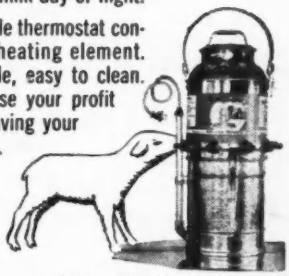

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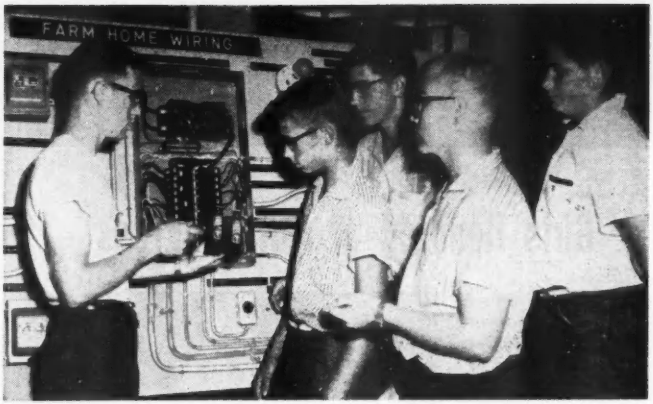


4-H boys study fundamentals of electricity in six sessions. Counselor is a college student. Upon satisfactory completion, boys receive certificate.

4-H Electric Course Gives Campers Basic 'Know-How'

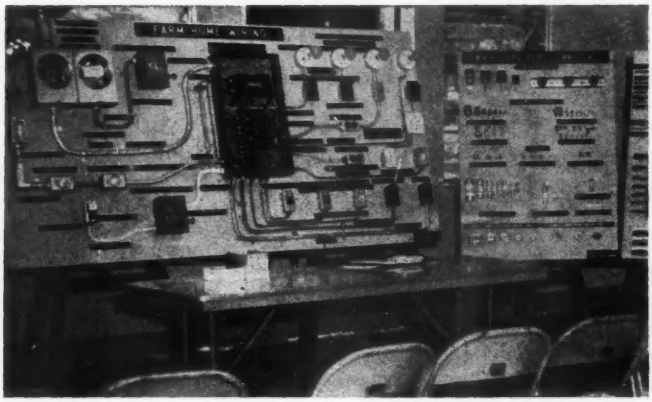
By OLIN GINN

Something new was added last year at the world's largest 4-H Club facility, Georgia's Rock Eagle Center near Eatonton. The "something new" was a course for boys in fundamentals of electricity.

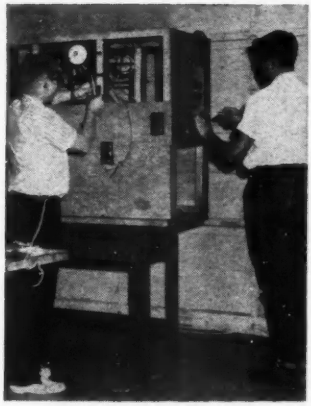
While girls continued to gather in another room of the Center's Collier Building to view and use the latest electric cooking, laundry and food preservation equipment, 4-H boys busied themselves with such activities as learning electrical terms, wiring simple circuits, installing 3-way switches, and figuring load and wire sizes.

The three-day course had six sessions. Under the direction of Paul Crawford, Extension Engineer, it was taught by University of Georgia student Nicholas Bledsoe. Upon successful completion of the sessions, 4-H'ers received certificates, and those who displayed unusual aptitude or interest also got a tie clasp.

Teaching panels were prepared by an electric power supplier and the extension engineer. Some of these were display panels that enable youngsters to see different kinds of switches, receptacles, cables, conduits, fittings and wiring devices. Others were work panels on which the boys practiced simple wiring jobs. They installed duplex receptacles, pull-chain lamp holders and toggle switches. Their most difficult assignment was to wire a lamp holder which was controlled from two locations by 3-way switches. These work panels



Panels (right) are used in classroom at 4-H center to display equipment used in wiring.



Low-voltage work panels allow boys to practice wiring without danger.

also had a 60-ampere service entrance switch with 4-circuit panel that let the youths see how the service entrance in their homes is wired.

Panels Had Low Voltage System

One unique safety feature of the work panels was that they were arranged so all equipment could be operated and tested by using only 12 volts. Another advantage of this low voltage check wiring system is that a poor connection or other trouble shows up more readily than with standard voltage.

4-H members and their leaders are really enthusiastic about this addition to the program at Rock Eagle. □ □

Sprinkler head is checked on his farm by George Spayd. The system provides moisture for blueberries as well as protecting them from frost damage.

Sprinkler Irrigation System Serves A Dual Purpose

A permanent irrigation system in his blueberry fields serves a dual purpose for George Spayd of Rocky Point, North Carolina. He irrigates to provide moisture and to protect berry crops from frost damage.

"In the past I have lost practically a whole crop due to frost," he explains. "Tests have shown that sprinkler irrigation will raise the temperature as much as 6° F. when there is a threat of frost."

With 50 acres in blueberries, Spayd has 20 acres under irrigation. Second year plants that were irrigated showed a 9-inch greater growth than those which received only normal rainfall, he declares.

His irrigation system is made of old boiler tubes which he bought at about the price of scrap. These are welded together, dipped in asphalt and painted on the exterior before being buried in his field. The pipes range from 2 to 6 inches in diameter. □ □

Boiler tubes bought at salvage price are dipped in asphalt and painted, then buried in blueberry fields to provide permanent irrigation system.

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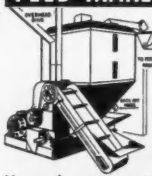

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Heat tapes for layers in winter

Protect Poultry Production

Better be sure laying flocks get plenty of water the year-round. Otherwise, there's a good chance that egg production and profits will drop.

One way to guard exposed pipes against freeze-ups and keep water from getting too icy for birds is the use of heating tapes. These tapes are easy to install, come in convenient lengths, and are readily available from poultry and farm supply firms.

Puts Heat Tape Under Troughs

H. D. Brankley of Skipwith, Virginia, uses heating tapes in his laying house. His hens are kept in eight rows of cages. A V-shaped trough extends between each pair of cage rows. Water in the troughs is about ½-inch deep. He uses a 100-foot length of heating tape on each trough to assure uninterrupted flow of water for his hens during the winter months. The plastic-covered tape is rated 7½ watts per foot.

The unique thing about Brankley's installation is that, instead of following the usual practice of placing the tape in the trough submerged in the water, he secured it to the bottom of the trough with 1½-inch masking tape. Advantages of this method, he explains, are that the tape does not interfere with cleaning and can be left in place throughout the year. After two years of use, he foresees no difficulty with the masking tape becoming loose.

While the heating tape may operate somewhat less efficiently when fixed to the underside of the trough than if submerged in the water, Brankley feels the added convenience is worth any difference. Besides warming water in the troughs, he has wrapped the heating tape around exposed pipes that supply each trough. The four tapes are controlled by a single thermostat. The heating tapes come with plugs attached for operation from a 115 volt receptacle. □ □

Heating tape is used to protect exposed water pipes and troughs in Brankley's poultry house. Note how tape is fixed to trough bottom.

Single thermostat controls operation of all four heating tapes in Brankley's house. The tape is rated at 7½ watts per foot and operates on 115 volts.

Part of litter of 14 pigs that went to market without casualty, thanks to heat lamp that warmed them from the moment they were born. Note porcelain socket. Fincher places lamps about 18 inches above litter at farrowing, then raises them at intervals to keep them beyond reach of growing pigs.

14 little pigs
and all went to market

BROODING PAID OFF

R. W. FINCHER of Cave Spring, Georgia, constructed a 20-unit farrowing house during the latter part of 1958. He got a quick lesson in the value of brooding pigs.

The first two litters farrowed in the new house came before he installed the 250-watt heat lamps. It was late November and 11 pigs from the two litters froze.

A short time later, a litter of 14 was born. They were brooded with heat lamps for four weeks. All lived to go to market. □ □

100-ampere panel in farrowing house has 10 circuits for brooding, 2 for lighting. Each brooding circuit serves 2 pens, up to four 250-watt lamps.

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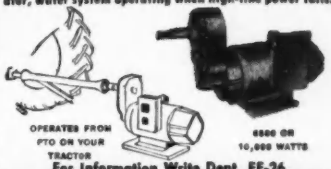

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The Columbiana Pump Co.
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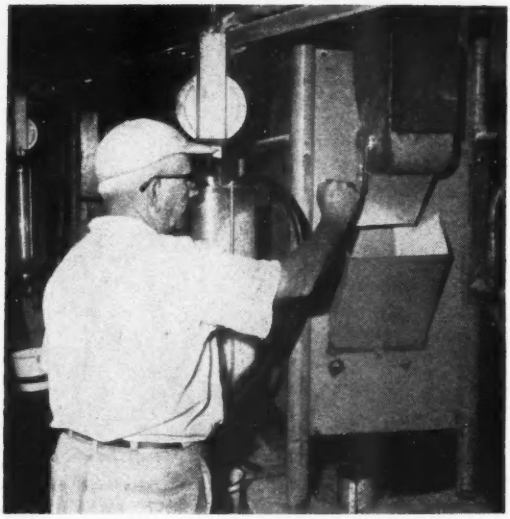
Dairyman Wouldn't Part With His Feed Processing System

Mississippi farmer figures it saves him $250 per month



In milking parlor, feeding is easy for Abbey. He just turns crank to issue correct amount of feed to each cow.

"If I had to give up my feed processing system, I'd sell my herd," declares dairyman R. H. Abbey of Webb, Mississippi. He is milking 65 cows in a modern walk-through parlor.

Abbey was one of the first dairymen in his state to begin on-farm processing of his feed. Until he installed his system almost four years ago, he was trucking his grain 36 miles to a commercial plant for custom grinding. He figures that he is netting $250 more per month by using the feed system.

The only difference in the ration he makes is that it contains no molasses. He uses bran, supplement, corn and oats.

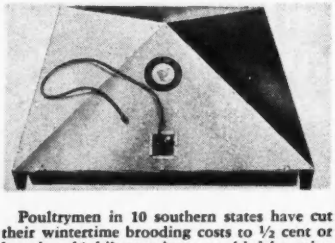
The feed is ground and mixed by a 2 hp electric mill that takes up to four ingredients. These ingredients are kept in bins above the mill so that they flow by gravity. If the flow of any ingredient stops, the mill turns off automatically. Also, the mill may be set to run for a specific interval and left alone while other chores are being done.

Abbey located the storage bins for his ingredients in the loft of an old milking barn. The mill is on the ground level and the new milking parlor is next to this barn.

After the feed is ground, it is lifted back to the loft-level by a bucket conveyor with 1/5 hp motor. The feed is dumped into a storage hopper from which a 4-inch auger moves it to the feed chutes above the milking parlor. Abbey also has a conveniently-located downspout where he can load feed from the storage hopper into truck or trailer for delivery to animals housed elsewhere. □ □

Bucket elevator lifts feed from ground-level mill into storage hopper at left. Auger then moves it to downspouts.

CUT Brooding Costs with BAILEY'S *Electric* Brooders



Poultrymen in 10 southern states have cut their wintertime brooding costs to ½ cent or less than ½ kilowatt hour per bird by using Bailey's Electric Brooders.

Performance like this is no accident. Poultrymen and agricultural and electrical engineers designed Bailey's Model 750. The rigid 72 x 72 inch hover has ½ inch of fiberglass insulation. Temperature is automatically controlled by dial setting. Unit comes fully equipped with pilot light, attraction light, 8-foot heavy duty cord. 750-chick capacity, 1500 watts, 115-120 volts.

Bailey's electric brooders were designed from the start to be the best!

Manufactured by

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COWS CHOOSE AUTOMATIC WATERERS

Small basin insures supply of fresh water. Electric service for 200-watt heating element is extended underground from pole in background.

Give your dairy cattle the chance, and they'll choose water from an automatic waterer over that from a pond or concrete trough. This is the experience of Walter Watkins, who manages a 72-cow dairy at Homewood Farm, Orange County, Virginia.

Waterers Heated Electrically

There is a good reason for this, he says. Water from the automatic waterer is fresher and warmer in winter, fresher and cooler in summer. Watkins uses two automatic units for his herd. They are mounted in concrete. Each has a 200-watt heating element that is thermostatically-controlled and comes on when water temperature drops below 40°.

The bowls hold only a small amount of water, but the supply is replenished as fast as the cows drink. This accounts for the cooler water in summer.

Cows Drink More Warmed Water

The heating elements have insured a 24-hour supply of water for the dairy herd, even in occasional zero weather, Watkins says. This constant supply of warm water in winter means the cows drink more. As a result, milk production is higher.

"We have a pond and concrete trough that the cows have access to," the Virginian commented, "But they hardly ever drink from them. They choose the automatic waterer." □ □

NOW! Winter-safe hog farrowing with EASY-HEAT

EASY-HEAT has made it so simple to install electric heat in concrete! Galvanized steel mesh mats, with heater wire anchored in place, simply roll out in 6′ or 10′ lengths. These 18″ wide units will not float as concrete is poured—uniformly even heat is assured. Farrowing is practical all winter long! EASY-HEAT is also ideal to dry and warm milkhouse floor.

Ask your power company fieldman, or write for literature.

EASY-HEAT, INC.,
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ADVERTISERS

in this issue . . .

Whenever you need further information about electrical equipment and appliances, you can depend upon the Manufacturers who are advertising in this magazine. We have indexed here for your convenience in alphabetical order the Manufacturers whose advertising is appearing in this February issue.

When writing to these Manufacturers be sure to mention you saw their advertising in ELECTRICITY ON THE FARM Magazine.

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If you are unable to get information about the particular equipment you require from our advertisers as listed above, our Reader Service Department will be glad to help you. As a reader of this magazine you are entitled to this information service free of cost.

Setting temperature on these electric hovers is easy as setting dial on electric oven. Brooders are kept close to litter to conserve heat.

Brooders that 'Work Like a Charm'

Georgia widow finds electric units help keep broiler raising easy

Broilers are both a hobby and a source of income for Mrs. Mattie Seymour of Royston, Georgia. She is not "big" as broiler producers go. In fact, she has only one 4,500-bird house. A widow, she looks after the chicks while her daughter works away from home.

The absence of a man around the house to do heavier labor has caused Mrs. Seymour to concentrate on keeping her broiler business easy to operate. She has found that five electric hover brooders fit her needs perfectly.

"They work like a charm," she explains. "Why, we just dial the temperature we want for the chickens like we would if we were fixing to use an electric oven. It's that easy."

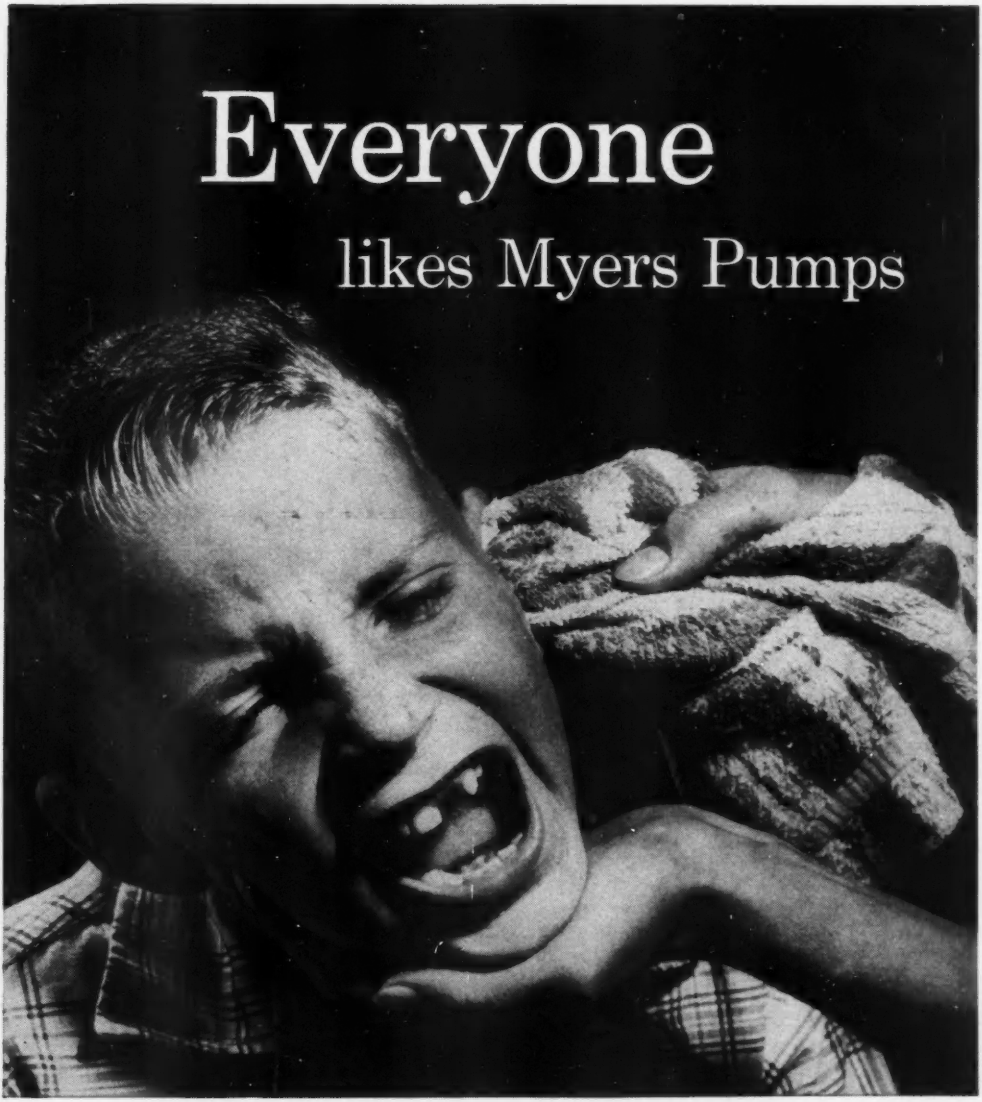
When the chicks are four or five weeks old and no longer need brooding, the brooders are lifted out of the way by a permanently-installed system of ropes and pulleys. When they are lowered for the next brood of chicks, no cleaning or adjusting of parts is necessary. Just dust off the hovers, Mrs. Seymour observes.

Do the brooders have to be raised as the chicks grow? "No," says Mrs. Seymour. "We fix the brooders so that the curtains are close to the litter at the start. They say that conserves heat. As the chickens grow, they work the wood shavings down so they don't have any trouble getting under the brooder."

What about operating cost? To the Seymours this is one of the best parts of all. Their year-round brooding cost is less than 3/10 KWHr per bird. □ □

Southeast Edition No. 1

No. 1 Southeast Red Edition



Yes, even Bobby . . . ! He may have a doubt or two when mom scrubs his ears. But when he sees that cold, sparkling glass of water at the table, his doubts vanish. Just like all water service problems vanish when you install a dependable Myers OLYMPIAN pump. See your Authorized Myers Pump Dealer today! He's fully qualified to engineer the right pumping system for your home or farm.

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Automatic electric storage-type water heaters provide a dependable supply of hot water for use in the milk house.

An automatic electric storage-type water heater mounted from ceiling and a thermostatically controlled space heater in a modern milk house.

THIS MAGAZINE is sent to you each month as a service of our Agricultural Development Dept. It contains new ideas and developments which can help you increase yields and profits—cut time and labor for routine chores. If we can be of service to you, just call your nearest C. P. & L. Office.

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